

Hall D Wire Characterization

Samples S1-1 & S1-2

1. **Sample preparation:** ultrasonic cleaning in DI water for 45 minutes.
2. **Sample installation:** for SEM inspection wires were installed on a sample holder (diameter=36 mm) on 2 stripes of conductive carbon tape, 2 fragment of each sample per stripe (nomenclature: S3-1a, S3-1b and S3-2a, S3-2b).

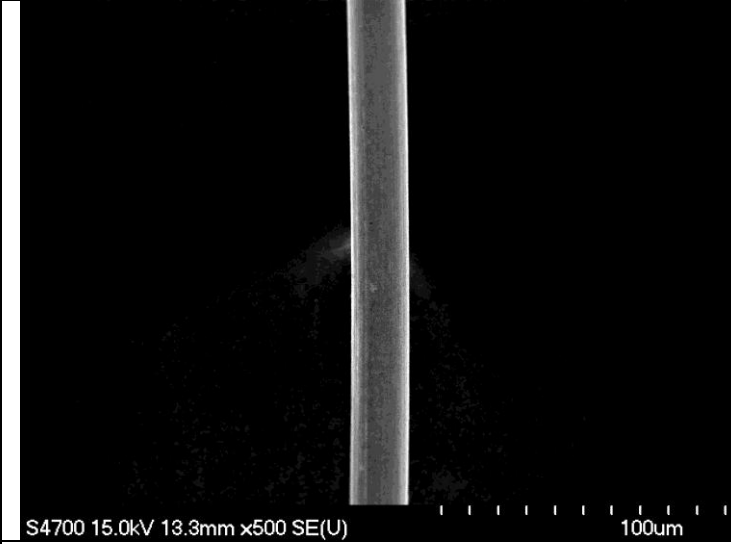
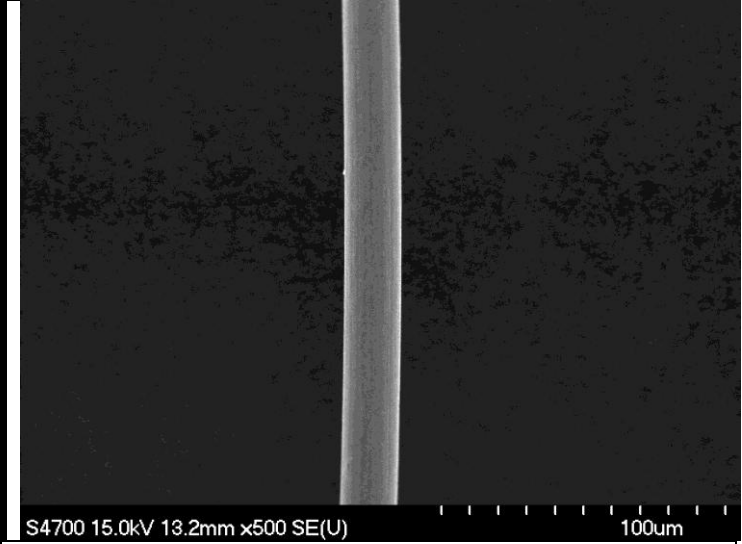
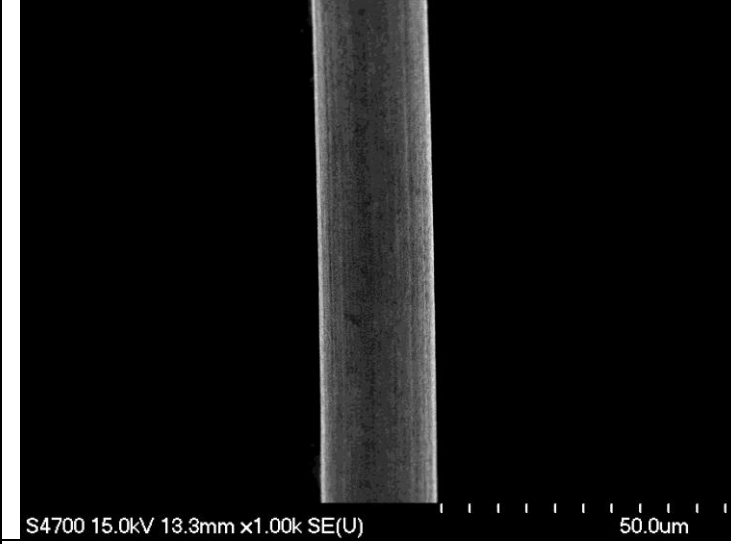
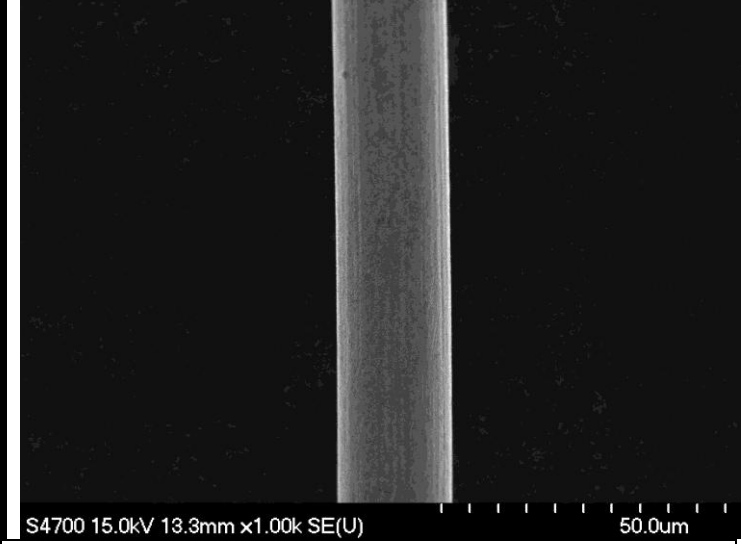


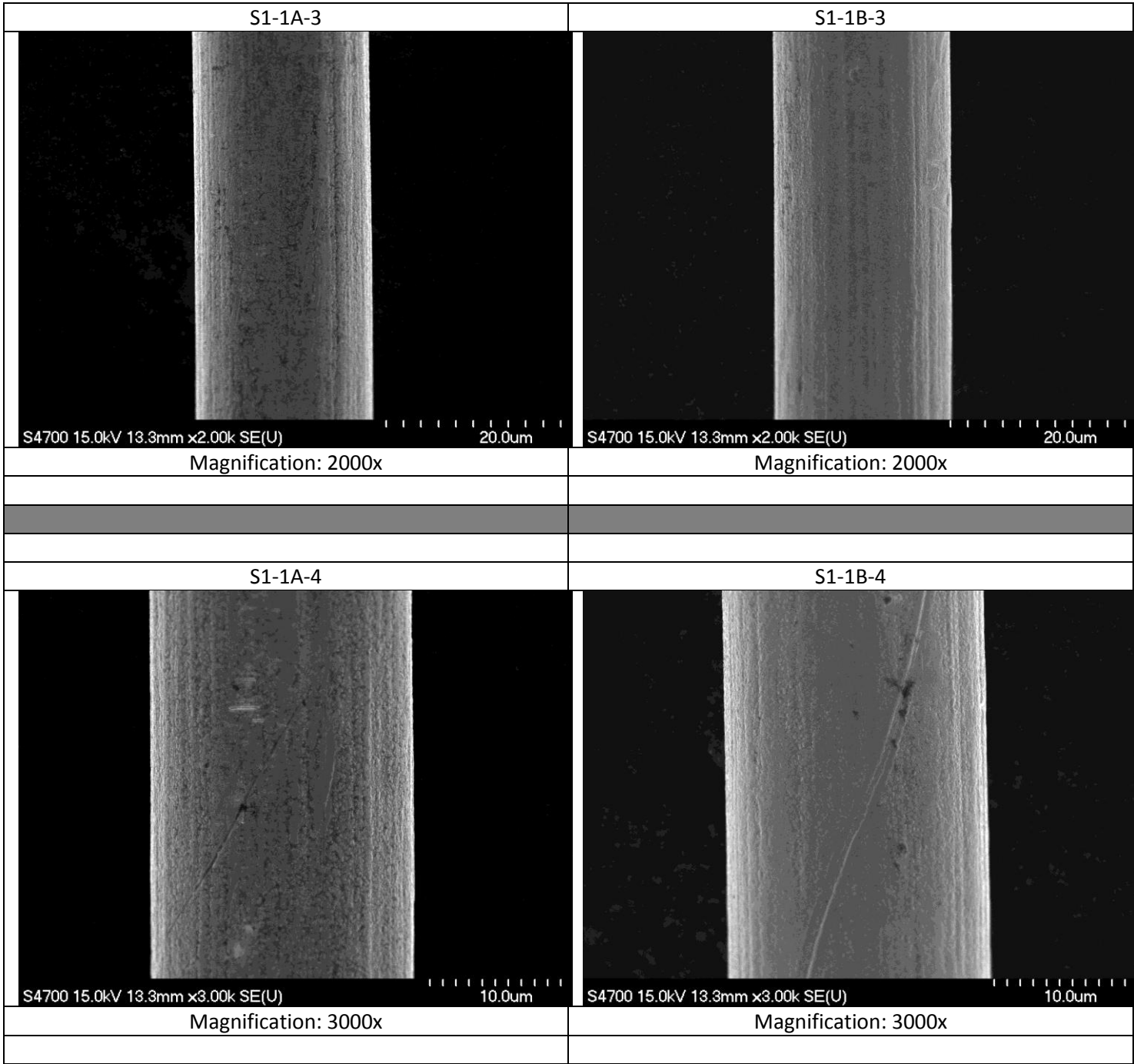
Pic1. Typical sample installation.

3. **Wire inspection:**
 - a) Each wire fragment was examined along its length (beginning at approximately 5mm from the sample holder edge and ending ~5mm before the opposite edge) at magnification of ~1Kx, at fast scan rate.
 - b) Images at designated magnifications were taken randomly along the sample length;
 - c) Images for the ovality measurements were taken at 4000x magnification in three points of each wire fragment: in the middle (approximately) and close to both ends;
 - d) Measurements of wire diameter, as visible on the images, were done using the Quartz PCI Image Management System, 3 measurements per image;
 - e) Additional images at various magnifications were taken at the points of interest (variations in sample topography, contaminated areas, etc.)
 - f) EDS analysis was performed on the most typical points of interest.

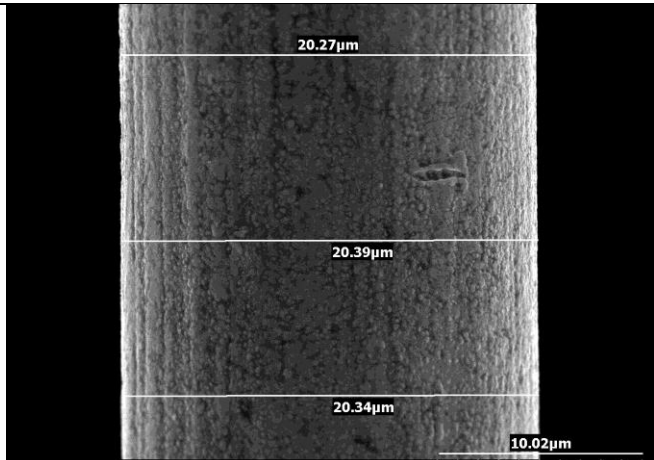
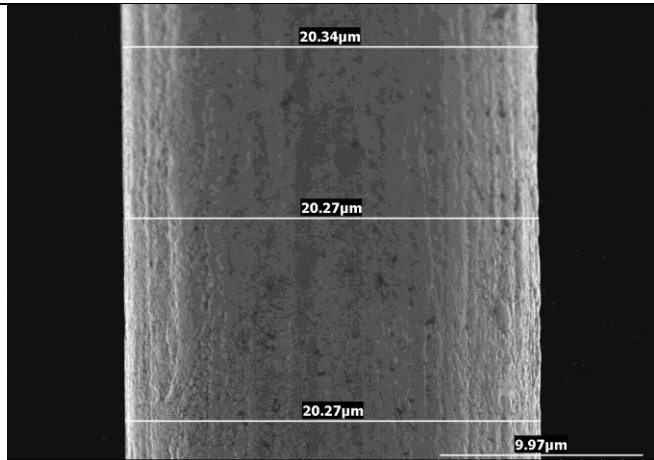
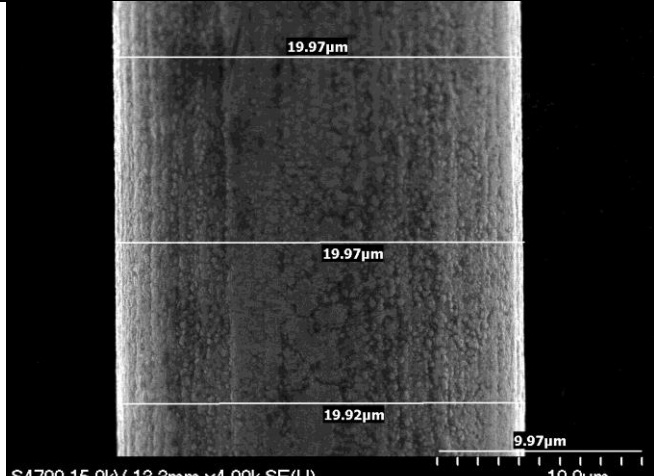
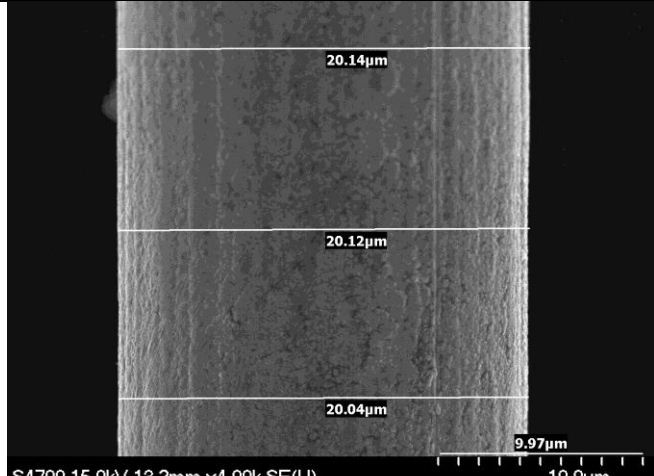
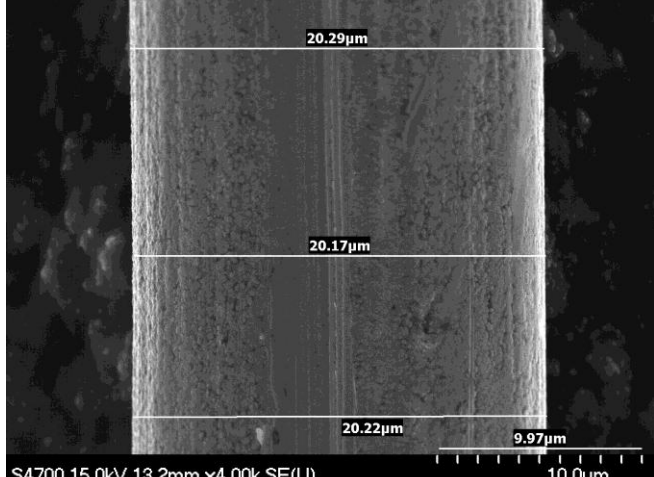
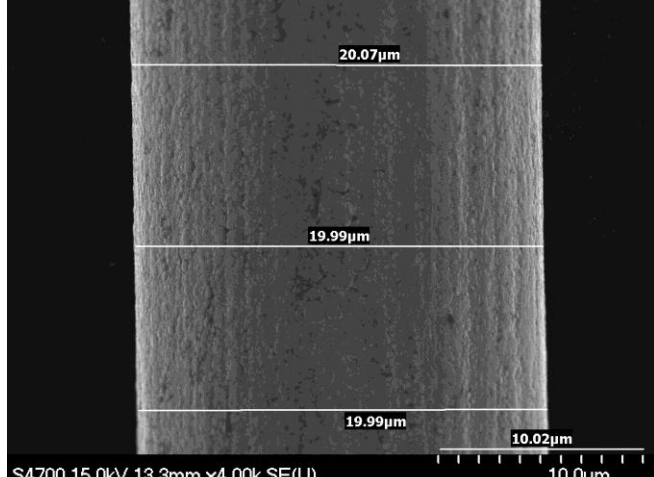
Sample S1-1 A, B

I. Images at designated magnifications

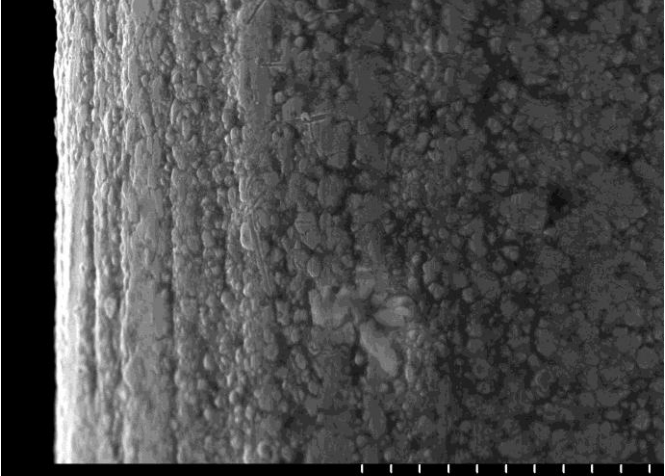
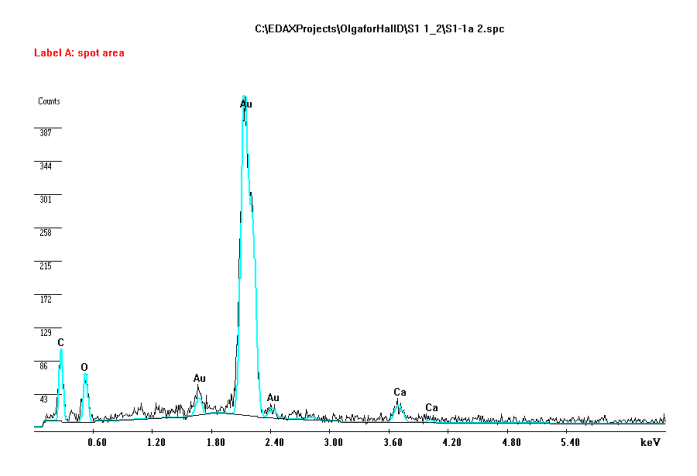
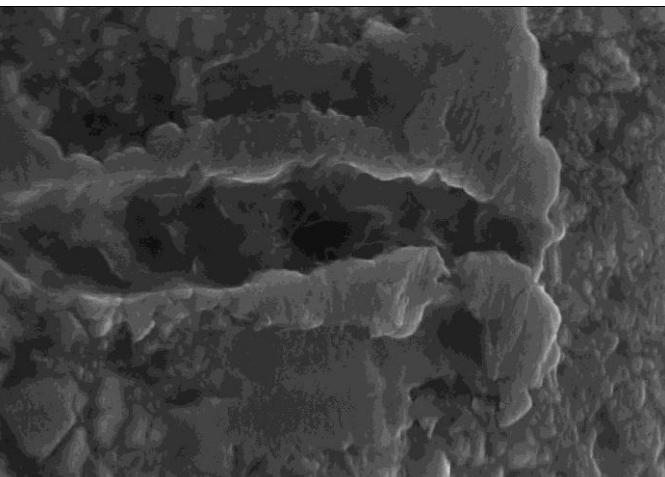
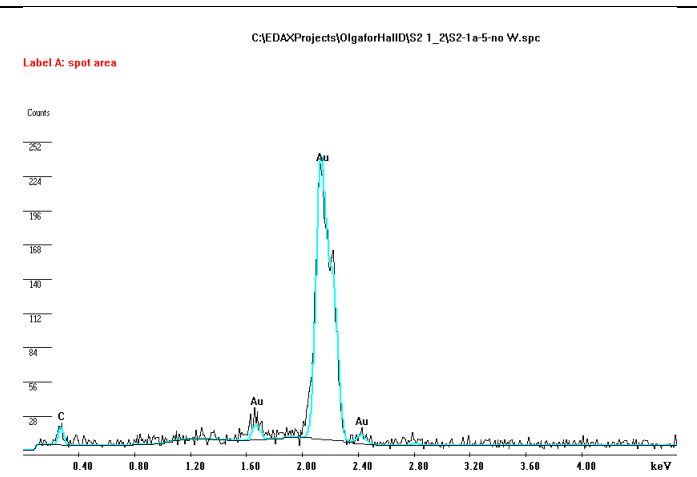
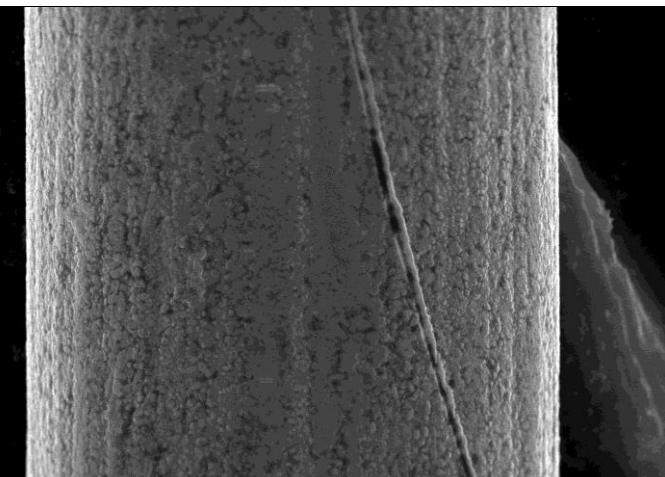
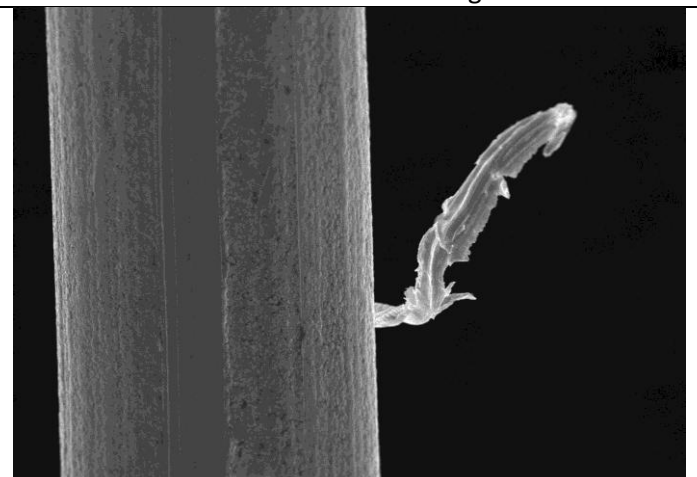
S1-1A-1	S1-1B-1
 <p>S4700 15.0kV 13.3mm x500 SE(U) 100um</p>	 <p>S4700 15.0kV 13.2mm x500 SE(U) 100um</p>
Magnification: 500x	Magnification: 500x
S1-1A-2	S1-1B-2
 <p>S4700 15.0kV 13.3mm x1.00k SE(U) 50.0um</p>	 <p>S4700 15.0kV 13.3mm x1.00k SE(U) 50.0um</p>
Magnification: 1000x	Magnification: 1000x

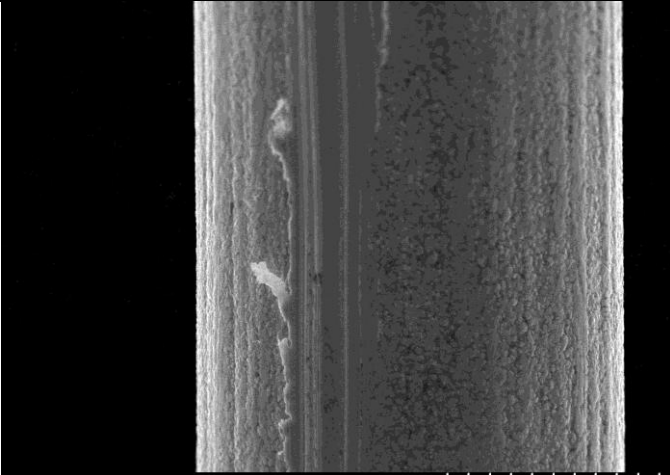
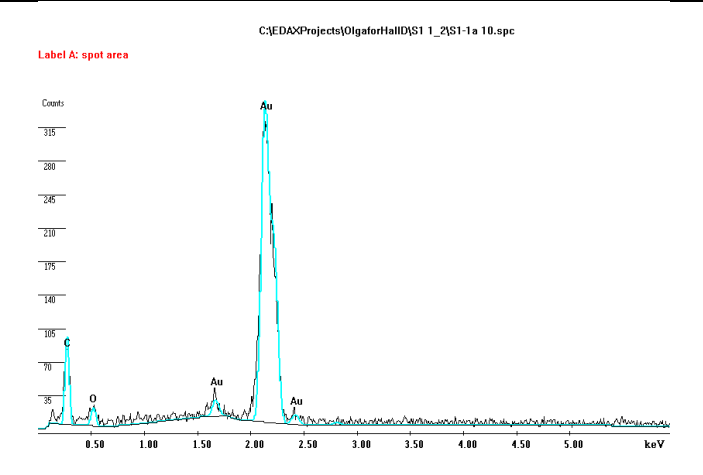
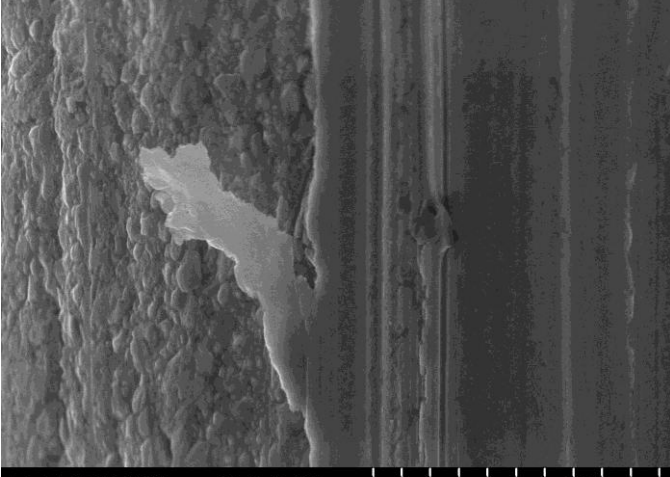
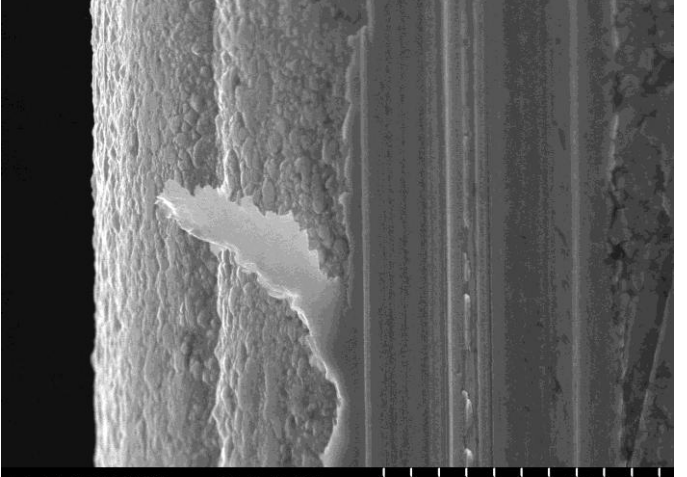
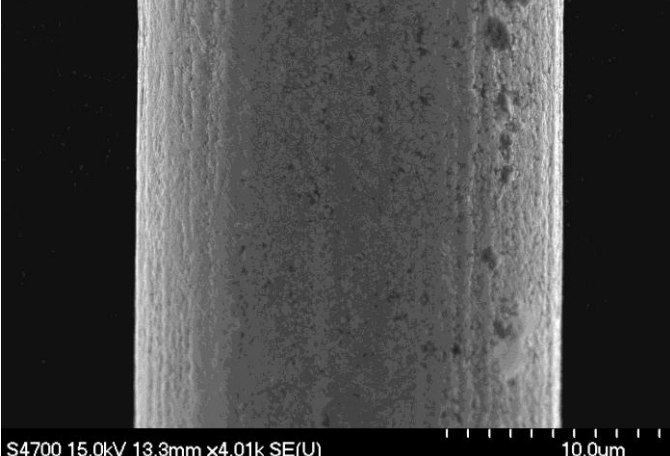
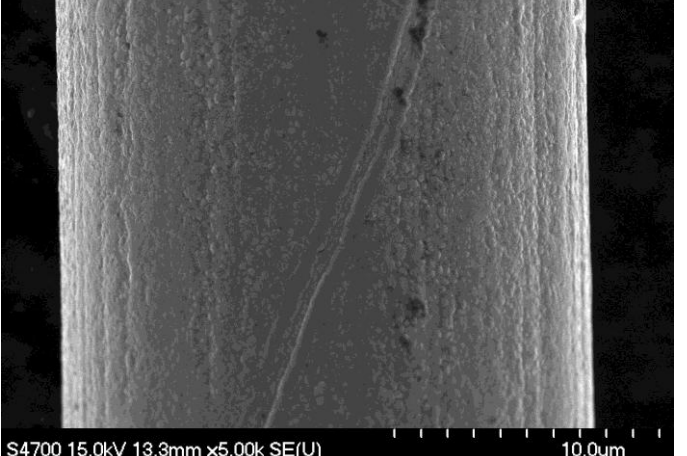


II. Ovality Measurements

<p>S1-1A-1o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>	<p>S1-1B-1o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>
<p>Magnification: 4000x</p>	<p>Magnification: 4000x</p>
<p>S1-1A-2o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>	<p>S1-1B-2o</p>  <p>S4700 15.0kV 13.2mm x4.00k SE(U)</p>
<p>Magnification: 4000x</p>	<p>Magnification: 4000x</p>
<p>S1-1A-3o</p>  <p>S4700 15.0kV 13.2mm x4.00k SE(U)</p>	<p>S1-1B-3o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>
<p>Magnification: 4000x</p>	<p>Magnification: 4000x</p>

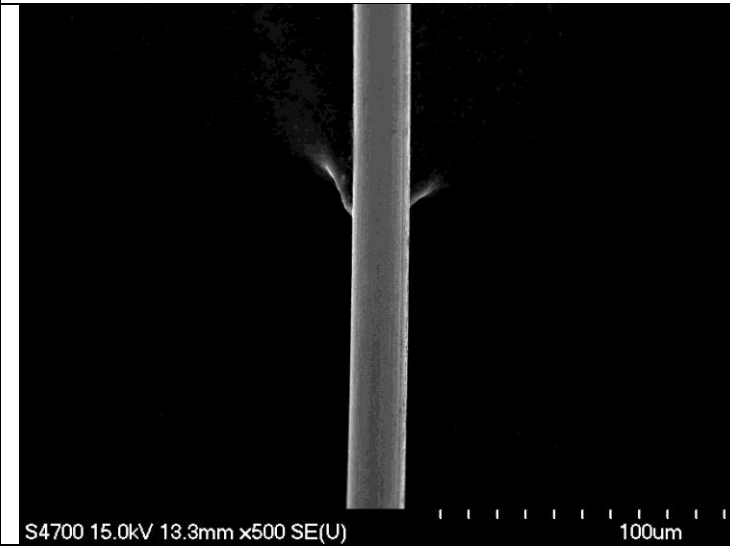
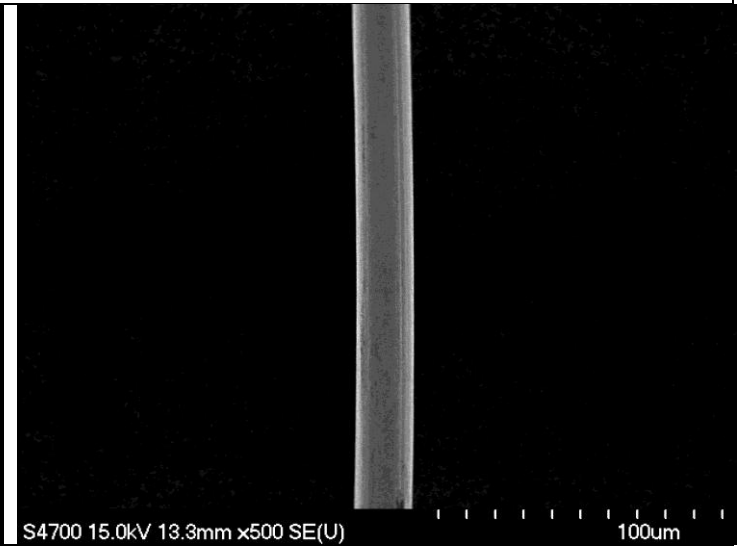
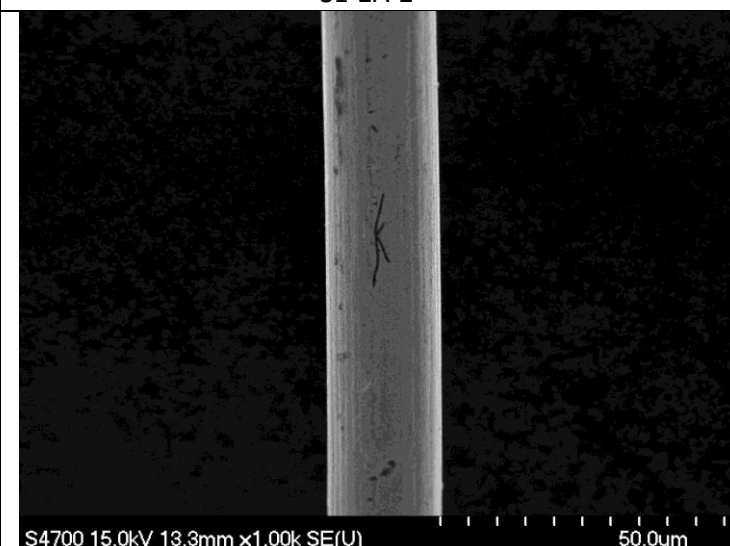
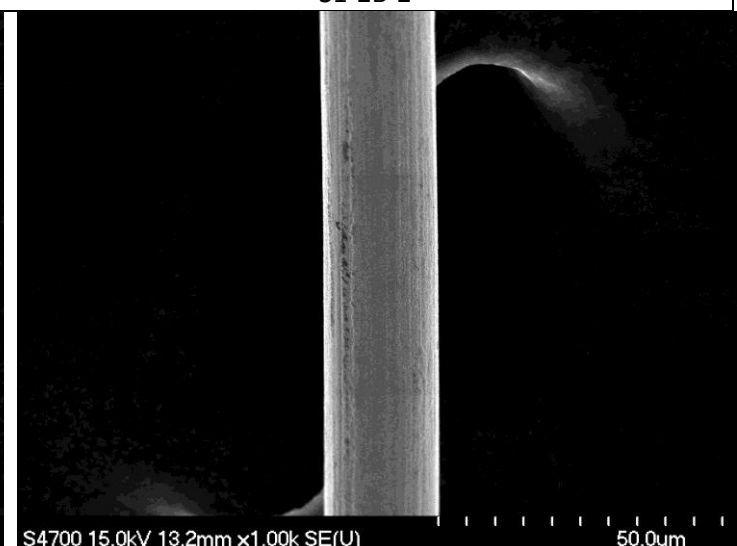
II. Points of Interest

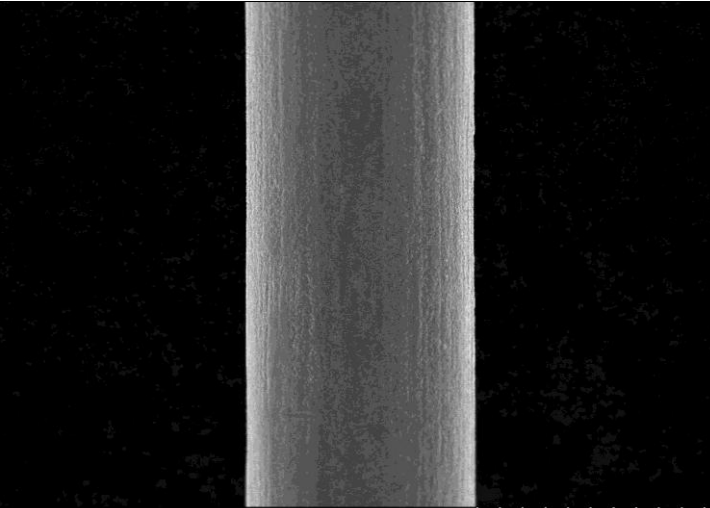
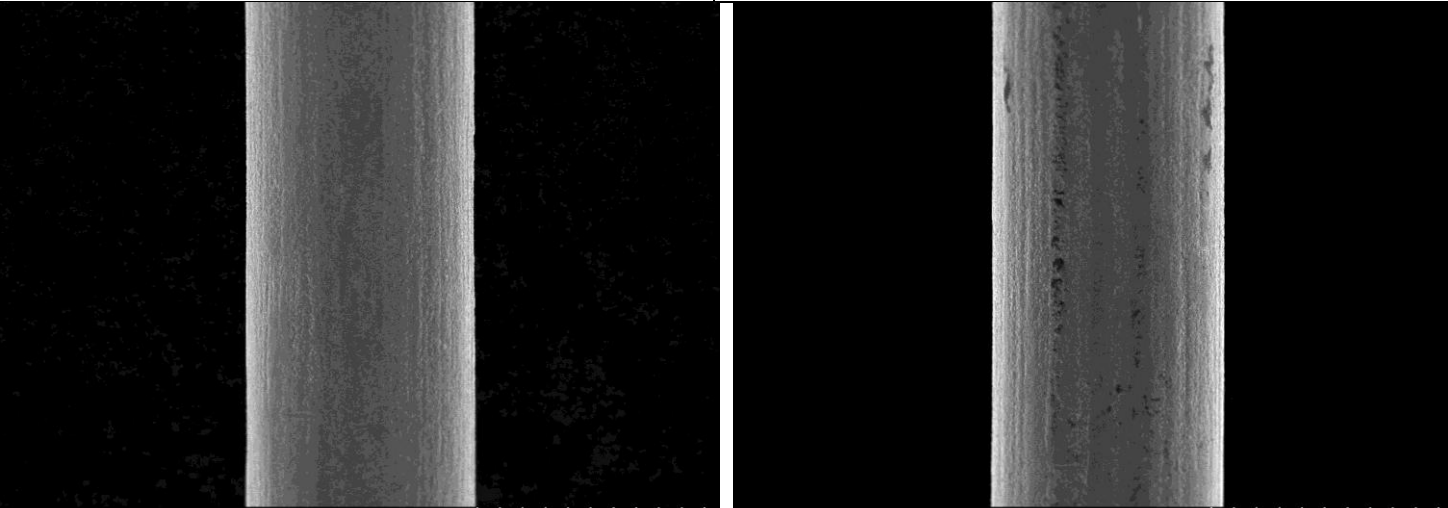
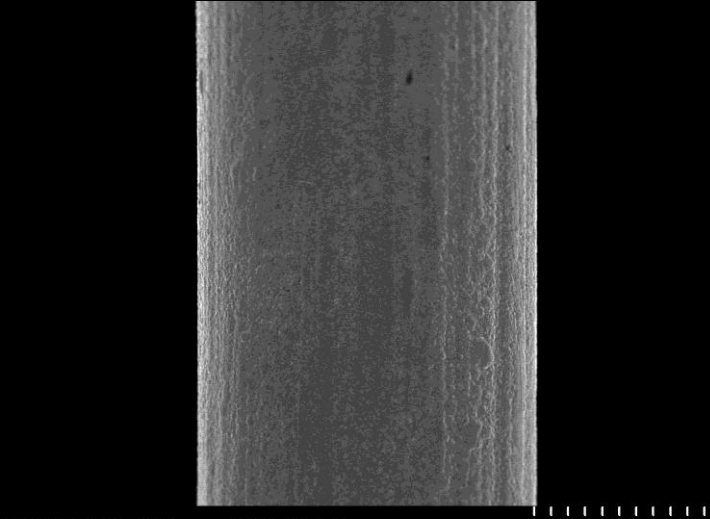
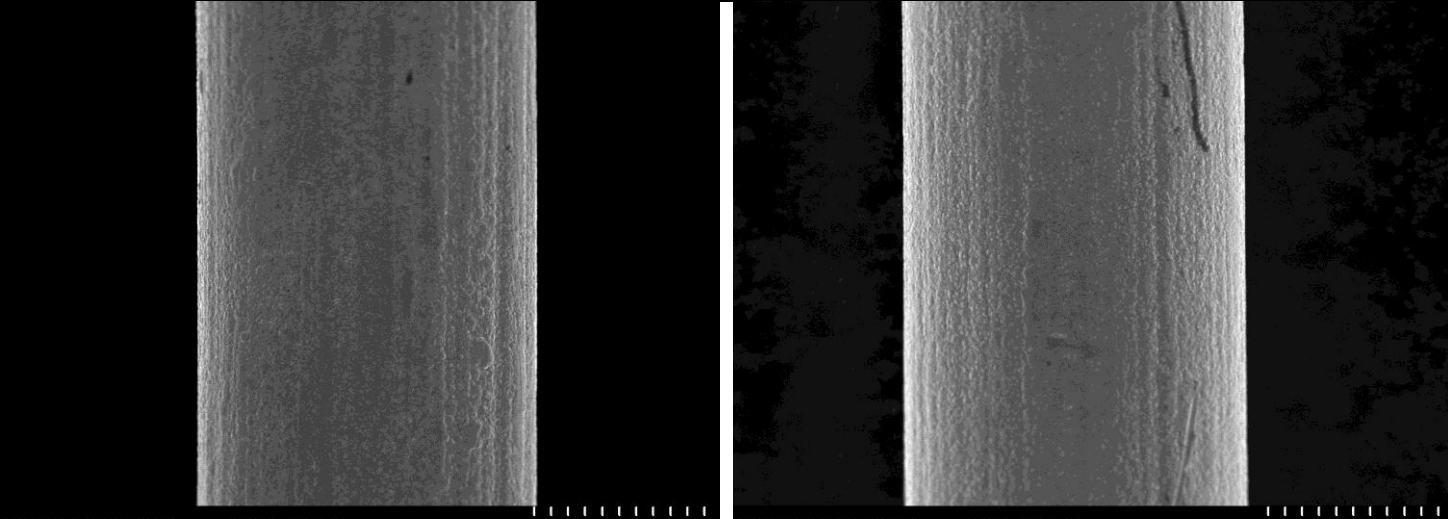
<p style="text-align: center;">S1-1A-2 Coating imperfection.</p>  <p style="text-align: center;">Magnification: 11000x</p>	<p style="text-align: center;">S1-1A-2 Environmental contamination.</p>  <p style="text-align: center;">EDS Analysis. Traces of Ca.</p>
<p style="text-align: center;">S1-1A-4 Scratch</p>  <p style="text-align: center;">Magnification: 40000x</p>	<p style="text-align: center;">S1-1A-4</p>  <p style="text-align: center;">EDS Analysis. No W</p>
<p style="text-align: center;">S1-1A-9 Scratch.</p>  <p style="text-align: center;">Magnification: 5000x</p>	<p style="text-align: center;">S1-1A-14 Surface damage.</p>  <p style="text-align: center;">Magnification: 3000x</p>

<p>S1-1A-10 Surface damage.</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U) 10.0um</p>	<p>S1-1A-10</p>  <p>C:\EDAX\Projects\OlgaforHallID\S1_1_2\S1-1a 10.spc</p> <p>Label A: spot area</p> <p>Counts</p> <p>keV</p>
<p>Magnification: 4000x</p>	<p>EDS Analysis. No W.</p>
<p>S1-1A-11 Surface damage in high mag.</p>  <p>S4700 15.0kV 13.3mm x18.0k SE(U) 3.00um</p>	<p>S1-1A-14 Surface damage.</p>  <p>S4700 15.0kV 13.3mm x13.0k SE(U) 4.00um</p>
<p>Magnification: 18000x</p>	<p>Magnification: 13000x</p>
<p>S1-1B-7 Minor surface contamination</p>  <p>S4700 15.0kV 13.3mm x4.01k SE(U) 10.0um</p>	<p>S1-1B-11 Scratch.</p>  <p>S4700 15.0kV 13.3mm x5.00k SE(U) 10.0um</p>
<p>Magnification: 4000x</p>	<p>Magnification: 5000x</p>

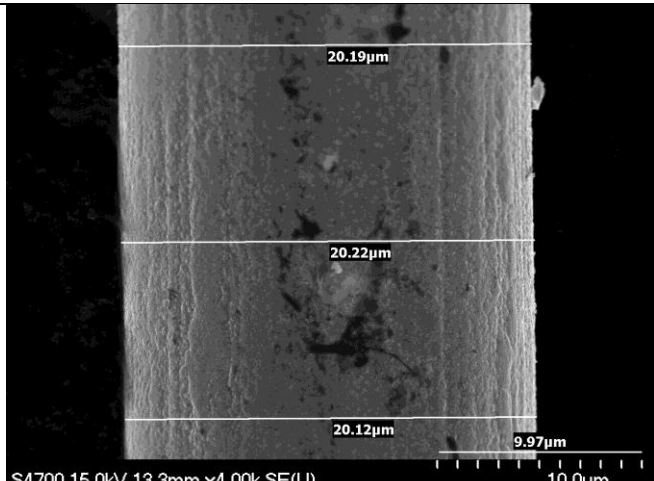
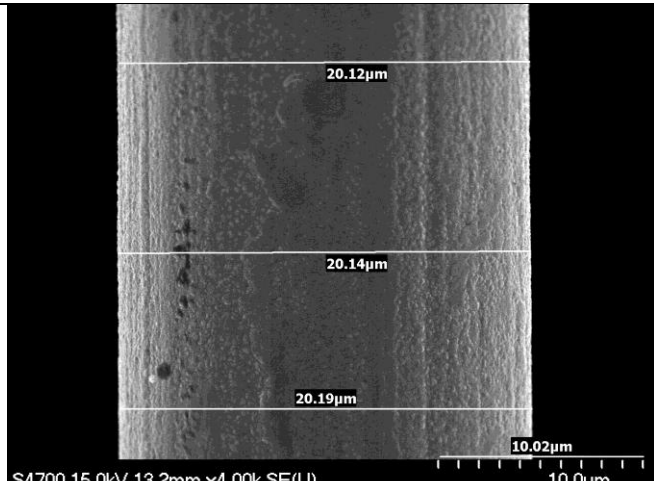
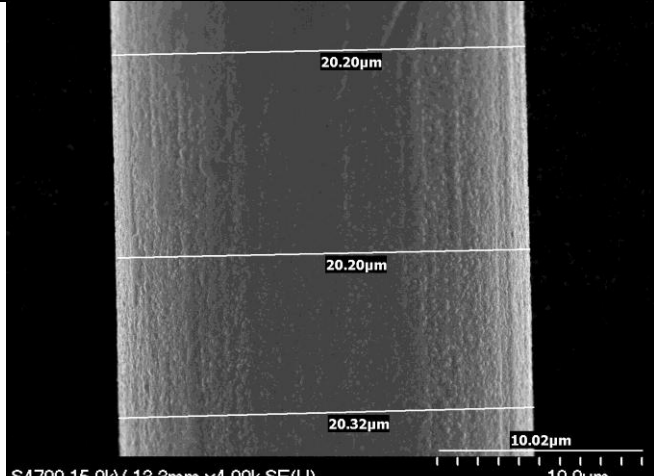
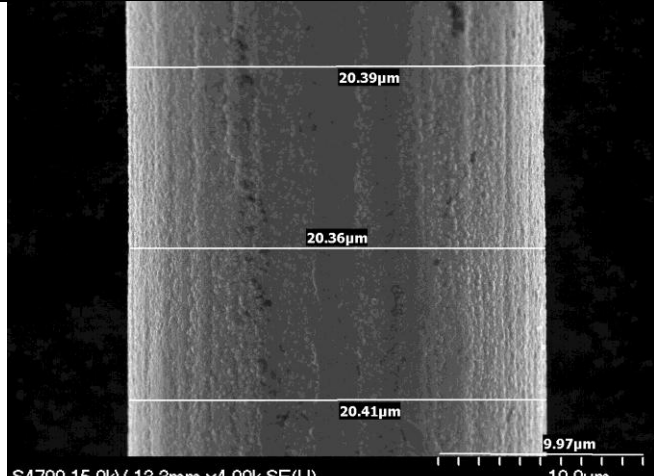
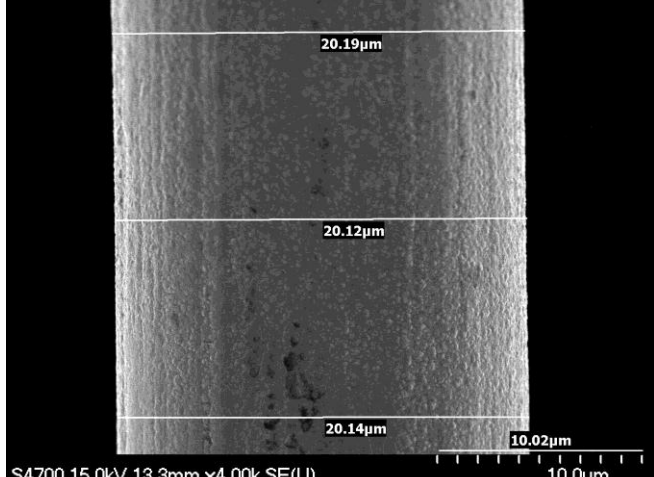
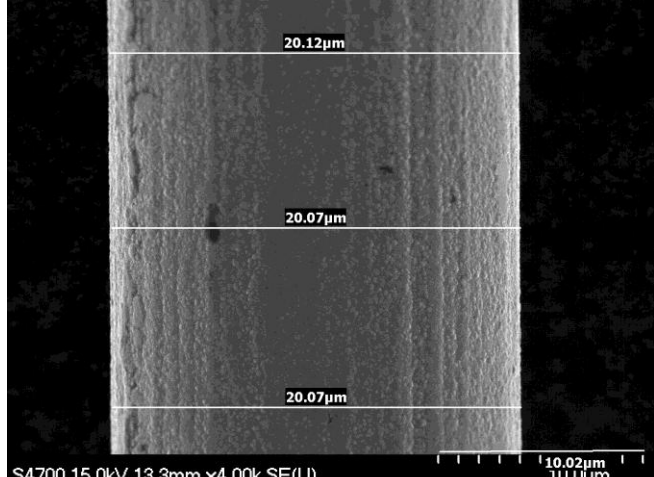
Sample S1-2 A, B

I. Images at designated magnifications

S1-2A-1	S1-2B-1
	
Magnification: 500x	Magnification: 500x
S1-2A-2	S1-2B-2
	
Magnification: 1000x	Magnification: 1000x

S1-2A-3	S1-2B-3
	
Magnification: 2000x	Magnification: 2000x
S1-2A-4	S1-2B-4
	
Magnification: 3000x	Magnification: 3000x

II. Ovality Measurements

<p>S1-2A-1o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>	<p>S1-2B-1o</p>  <p>S4700 15.0kV 13.2mm x4.00k SE(U)</p>
<p>Magnification: 4000x</p>	<p>Magnification: 4000x</p>
<p>S1-2A-2o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>	<p>S1-2B-2o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>
<p>Magnification: 4000x</p>	<p>Magnification: 4000x</p>
<p>S1-2A-3o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>	<p>S1-2B-3o</p>  <p>S4700 15.0kV 13.3mm x4.00k SE(U)</p>
<p>Magnification: 4000x</p>	<p>Magnification: 4000x</p>

II. Points of Interest

